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**REPORT ON THE EVALUATION ASSESSMENT
OF THE
TECHNOLOGY OPPORTUNITIES IN EUROPE PROGRAM (TOEP)**

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REPORT ON THE EVALUATION ASSESSMENT
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EVALUATION DIRECTORATE
DRIE
May, 1988

REPORT ON THE EVALUATION ASSESSMENT OF THE
TECHNOLOGY OPPORTUNITIES IN EUROPE PROGRAM (TOEP)

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05/05/88

I. INTRODUCTION

The Technologies Opportunities in Europe Program (TOEP) has been in place for less than two years. However, an evaluation was deemed necessary in view of the September 1988 deadline for receiving applications and of the need for program management to see if a request for new financing was warranted.

An evaluation had thus been normally scheduled as part of the plan for 1988-1989. This was reinforced in March by a specific request by the Deputy Ministers of DRIE and MOSST "that an immediate evaluation be conducted on TOEP to determine whether a more focussed industrial cooperation instrument is required (perhaps stressing strategic technologies and partnerships and joint ventures)."

This evaluation assessment represents the planning phase for the evaluation. This assessment report is made up of (i) a program profile, which describes the various elements of the program, (ii) an evaluation design, which lists issues, indicators, data sources and methodologies, (iii) options for evaluation, and (iv) recommendations.

The assessment has been conducted by the Evaluation Directorate under the guidance of a Steering Committee including representatives from Policy and Evaluation, Industry Marketing, Development Programs and Investments, External Affairs and the National Research Council.

II. PROGRAM PROFILE

1. Background

In the Fall of 1985, eighteen European countries collectively launched "Eureka", an initiative to advance the development of new technology by European industry. This initiative is designed to intensify European cooperation in major strategic technology projects directed at markets of the future. These projects are to be oriented towards the development of new products, systems and services designed for civilian purposes and involving international market potential.

As a non-European country, Canada is not a member of Eureka. Canadian firms resident in Europe can participate directly in the program in European countries where foreign subsidiaries are treated as national firms. However, it was also determined that potentially significant opportunities existed for non-resident Canadian firms to participate in Eureka projects in collaboration with a European firm or research institute.

The Technology Opportunities in Europe Program (TOEP) was launched in September 1986 with an initial budget of \$20 million. It was decided to create a new program because existing DRIE programs had been determined to be unsuitable to support Eureka related activities. TOEP was put in place to support the Prime Minister's interest in promoting industrial cooperation with Europe and focus the attention of Canadian firms on Eureka opportunities.

2. Mandate

The Technology Opportunities in Europe Program (TOEP) was approved by Treasury Board in September 1986, with a sunset date of September 30, 1988 for receipt of applications. Terms and conditions, including the provision for advance payments, were also approved at the same time. Specifically, Treasury Board approved:

1. "a new program ... which will provide financial support for Canadian firms to explore opportunities to participate in Eureka projects and to undertake collaborative R&D activities with European partners in the context of such projects;
2. the terms and conditions for payment of contributions under this program ..."

The authority for this program comes from Section 5.1(d)(i)(ii) of the Department of Regional Industrial Expansion Act.

The total estimated cost of the program, \$20 million over the six years 1986-87 through 1991-92, is chargeable to DRIE-Vote 10, as follows:

	<u>Fiscal Year</u>						
	(\$ Millions)						
	<u>1986-87</u>	<u>1987-88</u>	<u>1988-89</u>	<u>1989-90</u>	<u>1990-91</u>	<u>1991-92</u>	<u>Total</u>
Initial Forecast	2.0	5.0	7.0	4.0	1.5	0.5*	20.0
Revised** Forecast	0.0	1.3	5.2	5.9	4.9	2.7	20.0

* Wind-up costs.

** Based on projections as of April 1, 1988.

3. Objectives

The Treasury Board Submission described the program objectives as follows:

"The purpose of TOEP is to assist Canadian-based firms to explore opportunities for technological collaboration in the context of Eureka, and to support such firms to participate in Eureka research projects. The objective of TOEP is to facilitate company-to-company technology development agreements and to provide the Canadian participants with financial support proportional to that received by European partners from their respective governments."

In a recent DRIE information package for applicants, the main program objectives were given as:

"to contribute to the growth of a strong high technology industry in Canada through the development of new technology and expertise in Canadian firms and through the promotion of industrial cooperation between Canadian and European firms. Specifically, the purpose of TOEP is to facilitate the participation of Canadian firms in Eureka high technology projects."

4. Description

The Technology Opportunities in Europe Program (TOEP) provides financial support for Canadian firms to explore opportunities to participate in Eureka projects and to undertake collaborative R&D activities with European partners in the context of such projects.

The Treasury Board submission stated that:

"Current DRIE programs have been determined to be unsuitable to support Eureka related activities. IRDP cannot support R&D performed offshore which may, in some cases, be necessary in the context of a Eureka project. As Eureka is focused exclusively on civilian-related technology, the Defense Industries Productivity Program (DIPP) was also deemed to be inappropriate. Hence a new program to be called Technology Opportunities in Europe Program (TOEP) is proposed."

The new program, TOEP, was therefore put in place, with an initial duration of two years, and a \$20 million budget.

TOEP's assistance is in the form of contributions provided under two program elements:

- (i) Investigation of Opportunities - contributions towards the eligible costs of exploring the potential for Canadian participation in both proposed and approved Eureka projects, and the eligible costs associated with negotiating an agreement with the European partner(s).
- (ii) Research and Development - contributions towards the eligible costs incurred by a Canadian-based company on research and development in the context of a Eureka project under an agreement with the European partner(s).

4.1 Activities

Program activities can be grouped under the categories "promotion", "administration" and "delivery". These activities involve mostly DRIE, but also External Affairs, both at headquarters and at the posts. In DRIE, several branches are involved: the International Affairs Branch is mostly involved in Eureka promotion activities;

the Information Technologies Industry Branch is primarily responsible for the administration of the program and does promotion also, besides processing the majority of TOEP applications; other Industry Marketing Sector Branches handle TOEP projects falling in their domain of expertise.

(a) Promotion activities:

- program promotion with Canadian firms
- program promotion within the department and with other departments
- program promotion with posts and with European firms
- ministerial missions
- promotion in Europe of Canadian expertise.

(b) Administration activities:

- translation of TOEP terms and conditions into policies and procedures
- preparation of information documents, promotional material
- monitoring and guidance for TOEP applications processing and approval processes
- liaison with posts, firms and within the department
- assignment of project applications in DRIE
- acting as secretariat for the Interdepartmental TOEP Committee
- TOEP financial planning and control
- handling of telex traffic
- maintenance of data bases on EUREKA and TOEP
- coordination of TOEP activities and responsibility for coordination mechanisms such as the TOEP Working Group
- participation in project audit and evaluation
- handling of enquiries.

(c) Delivery activities:

- receipt and assessment of applications
- preparation of project approval documents and submission
- letters of offer
- project administration (receiving reports, paying out contributions, dealing with interim reports, follow-up on benefits and repayments).

4.2 Program Outputs

The outputs under this program are contribution agreements with companies and disbursements made by DRIE to companies. Contributions are made towards the cost of exploratory visits to determine the potential for Canadian participation in Eureka projects, or towards costs incurred by a Canadian-based company on R&D for a Eureka project under an agreement with a European partner.

The eligible costs under each element are:

(i) Investigation of Opportunities

- economy airfare to Europe to gather information and undertake discussions and negotiations with possible European partners;
- fees paid to technical and legal experts for the preparation of a formal agreement with the European partner.

(ii) Research and Development

- the Canadian partner's share of the total costs attributable to the R&D performed as per the agreement with European partners on a Eureka project. Eligible costs differ, however, depending on whether the Canadian partner actually performs R&D in its own facilities in Canada, or participates in R&D carried out in Europe;
- in addition, in order to qualify for financial assistance, each project has to meet standard DRIE eligibility criteria plus the criterion that the project must be linked to an approved or proposed Eureka project.

The actual DRIE contribution under each element is a percentage of the eligible costs.

4.3 Impacts and Effects

Through the financing of certain activities by Canadian firms, the program is expected to have a number of impacts. The immediate impacts and effects result directly from the program outputs. They are followed, in a causal chain, by further (intermediate) impacts and effects. The ultimate impacts and effects of the program should lead logically to the program objectives.

4.3.1 Immediate Impacts

- participation by Canadian firms in missions to Europe
- individual exploratory visits to Europe
- investigation of Eureka projects
- intelligence re: new technology.

4.3.2 Intermediate Impacts and Effects

- agreements between Canadian firms and European partners concerning participation in an approved or planned Eureka project
- increased R&D work and expenditure by Canadian firms (in the context of a Eureka project)
- joint ventures with European partner
- industrial cooperation between Canadian and European firms.

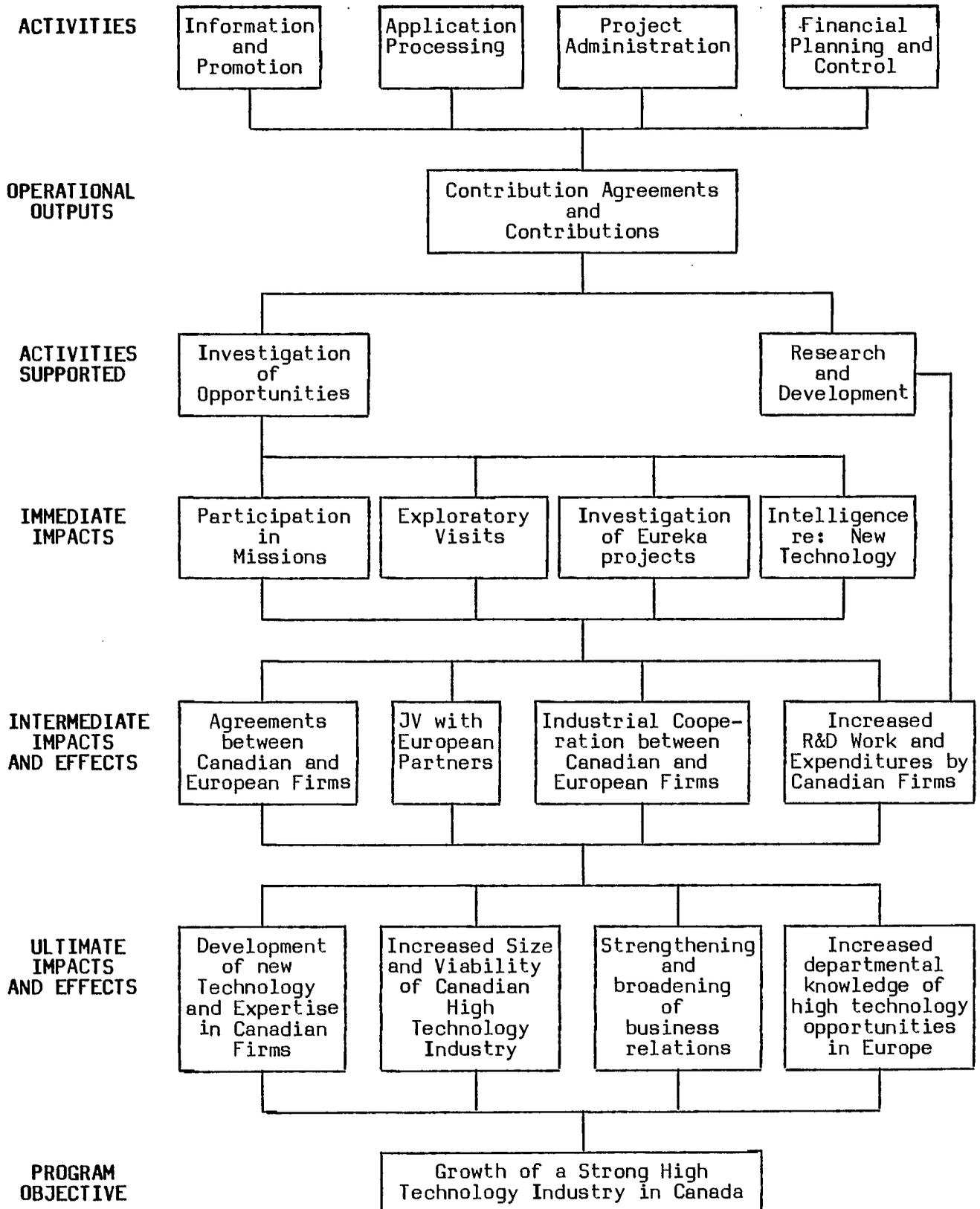
4.3.3 Ultimate Impacts and Effects

- development of new technology and expertise in Canadian firms
- improved market access
- increased size and viability of Canadian high technology industry
 - (e.g.: ° new technology acquired
 - ° new joint ventures/partnerships established
 - ° links to Canadian suppliers
 - ° enhanced intellectual property rights
- strengthening and broadening of business relations with Europe
- increased departmental knowledge of high technology opportunities in Europe.

TECHNOLOGY OPPORTUNITIES IN EUROPE PROGRAM (TOEP)

21/04/88

CAUSAL MODEL



III. EVALUATION DESIGN

A. Introduction

The evaluation design outlines the approach for an evaluation. It involves the identification of issues that could be addressed in an evaluation, indicators that would serve to address those issues, data and information sources for each indicator or issue, methodologies for information gathering and analysis. Evaluation options are then prepared and recommendations made as to one of those options.

B. Issues

Evaluation Issues

The list that is presented below represents the spectrum of plausible issues that could be addressed in an evaluation; an actual evaluation would not necessarily address all those issues. The latter were developed largely with the assistance of Steering Committee members and of those DRIE officers most involved in the delivery of the program.

As is customary, the issues are grouped under four broad categories:

a) Program Rationale

(Does the program make sense?)

b) Objectives Achievement

(Has the program achieved what was expected?)

c) Impacts and Effects

(What has happened as a result of the program?)

d) Alternatives

(Are there better ways of achieving the results?)

Suggested Evaluation Issues

1. RATIONALE

1.1 Program Design

1.1.1 Is there a need for TOEP at this time given the existence of other programs, such as TIP and IRAP, with some of the same objectives?

1.1.2 Is there a need for such a program for Europe?

1.1.3 Is Eureka the appropriate focus?

1.1.4 Is a contribution program, such as TOEP currently is, the most effective means of:

a) making Canadian firms more aware of opportunities for R&D cooperation with European firms;

b) encouraging Canadian firms to participate in R&D cooperation ventures with European firms; and

c) ultimately building a stronger R&D capability in Canada?

1.2 Program Delivery

1.2.1 Is the current placement and separation of responsibility for TOEP promotion, administration and delivery the most effective way to deliver the program?

1.2.2 Are adequate resources assigned to TOEP promotion, administration and delivery (i.e. personnel, O&M money, information access)?

1.2.3 Does the absence of multiple access inhibit the effectiveness of program delivery?

2. ACHIEVEMENT OF OBJECTIVES

2.1 In what manner and to what extent have the following objectives been achieved as a result of the program:

- to create awareness among Canadian firms about European technological developments and opportunities;
- to create awareness and credibility in Europe about Canadian expertise and interests in technological development;
- to encourage Canadian companies to investigate opportunities to participate in Eureka projects;
- to encourage Canadian companies to participate in Eureka projects.

3. IMPACTS AND EFFECTS

3.1 What agreements between Canadian and European firms have resulted from the program?

3.2 What has been the effect of the program on R&D activities and funding in Canadian firms?

- 3.3 Has the program led to the development, acquisition and exchange of new technology and expertise in Canadian firms?
- 3.4 How much awareness has the program created in Canada about new technological developments, and in Europe about Canadian expertise and interests?
- 3.5 Unintended impacts: have there been unintended impacts and effects from the program?

4. ALTERNATIVES

4.1 Alternative Design

- 4.1.1 Should the scope/focus of the program be enlarged beyond Eureka and even beyond Europe?
- 4.1.2 Should it remain a contribution program only?
- 4.1.3 Should new activities be supported and new types of assistance offered?

4.2 Alternative Delivery Mechanisms

- 4.2.1 Should TOEP be managed or located differently?
- 4.2.2 What resources are required for effective delivery of the program?

4.3 Alternative Instruments

- 4.3.1 Are there other existing programs that could achieve the same objectives more effectively or efficiently?

C. Discussion of Issues

The list given above includes issues that could be covered in a broad scope evaluation of TOEP. In an actual evaluation, at this time, only a number of those issues would be considered relevant or priority issues. This section looks at circumscribing the number of issues, based on certain criteria.

The first screening consists of eliminating, at this stage, issues under which the program could not be evaluated because of a dearth of evidence. This is for the most part the case with the substantive issues under the "Objectives Achievement" and "Impacts and Effects" rubriques, which are closely linked to one another. The program has been in place about a year and a half and the spending on projects is somewhat behind schedule. On the other hand, the objectives pursued are in the nature of longer term impacts on Canadian industry as was noted in the Treasury Board submission. The submission asked Ministers to note that the benefits flowing from TOEP will tend to be realized in the longer term, and will therefore be difficult to measure during the life of the program. Little evidence of those longer term impacts would thus be found at this juncture.

The other selection criterion for issues is senior management's needs. In ADM discussions at Cornwall in March, the possible expansion of TOEP to other countries and international programs was raised. In the DMs' Record of Decisions on Activity Working Group Reports, the focus was on undertaking an evaluation of TOEP to determine whether a more focussed industrial cooperation instrument is required (perhaps stressing strategic technologies and partnerships and joint ventures). This is clearly an emphasis on program rationale, design and on alternatives. Senior management's current interests also exclude "Objectives Achievement" and "Impacts and Effects" issues.

The rest of this evaluation assessment will therefore concentrate more on "Rationale" and "Alternatives" issues. The other issues would best be addressed in two or three years if TOEP were to remain as is or via a new evaluation framework and subsequent study if TOEP is expanded.

D. Indicators

<u>Issues</u>	<u>Indicators</u>
1. <u>Rationale</u>	
1.1 Program Design	
1.1.1 Is there a need for TOEP at this time?	- What assistance is exclusive to TOEP versus other programs? - What objectives are exclusive to TOEP versus other programs?
1.1.2 Is there a need for such a program in Europe?	- Opinion of DEA, NRC, DOC and DRIE officials - Opinion of program participants and non-participants
1.1.3 Is Eureka the appropriate focus?	- Idem
1.1.4 Is a contribution program the most effective means of achieving the TOEP objectives?	- Opinion of program participants and non-participants - Opinion of experts

1.2 Program Delivery

- 1.2.1 Placement and separation of responsibility for TOEP
 - Efficiency and effectiveness of promotion, administration and delivery
- 1.2.2 Resources for program delivery
 - Are all necessary tasks being performed adequately and in a timely fashion?
- 1.2.3 Absence of multiple access
 - Opinion of officers from DRIE and other departments/agencies

2. Achievement of Objectives

- 2.1 To what degree have the following objectives been achieved?
 - awareness among Canadian firms
 - Opinions of program participants and non-participants
 - awareness in Europe
 - Opinions of Canadian firms, of posts abroad, of DEA HQ
 - investigation of opportunities
 - Number of trips assisted
 - Canadian participation in Eureka projects
 - Number of Canadian firms participating in Eureka projects

3. Impacts and Effects

- 3.1 Agreements
 - Number of agreements (Eureka and non-Eureka)
 - Benefits to Canadian firms

- 3.2 Effect of the program on R&D activities and funding in Canadian firms
 - New or increased R&D activities and funding among program participants (compared to industry in general)

- 3.3 Development, acquisition and exchange of new technology and expertise in Canadian firms
 - New technology and increased expertise among program participants (compared to other firms in same sector)

- 3.4 Awareness in Canada and in Europe
 - Opinion of Canadian participants and non-participants
 - Opinion of posts abroad and of European officials or businessmen

- 3.5 Unintended impact
 - Opinion of Canadian firms involved
 - Opinion of officials involved

4. Alternative Instruments

4.1 Alternative Design

4.1.1 Enlarging program - DRIE, DEA, NRC, DOC,
company/Post/expert
opinion

4.1.2 Contribution program only? - Idem

4.1.3 New activities,
new assistance? - Idem

4.2 Alternative Delivery
Mechanism

4.2.1 TOEP managed and
located differently - Opinion of DRIE
officials

4.2.2 Different resources for
TOEP delivery - Idem and opinion of
companies

4.3 Alternative Instruments

4.3.1 Use of other programs to
achieve same objectives - comparison of objectives,
activities supported and
assistance provided

E. Data Sources and Methodologies

1. Data Sources

The sources of data and information available for use in an evaluation of TOEP are:

- basic program documentation
- program and project files
- DRIE officers involved in program promotion, administration and project delivery
- DEA officers at HQ and Posts
- firms which have had some program involvement
- officials, in DRIE or other departments and agencies, who are familiar with other programs operating in the same field.

2. Methodology Types

2.1 File Review/Document Search

All files related to the program would be reviewed in order to extract the relevant information such as:

- ° policy documents and memoranda, Treasury Board submissions, minutes of management committee meetings;
- ° administrative files including project proposals, types of projects accepted/rejected, types of clients;
- ° financial statements and records, program and project costs;

- ° client records;
- ° project files and records, including starting dates of projects, project personnel, benefits expected/achieved.

The study of documents would assist in addressing rationale issues; program and project files would be geared more towards assessing impacts and effects and objectives achievement issues.

2.2 Interviews with Officials

Apart from program and project files and records, an important source of information is the officials, mainly within DRIE, who are involved in program delivery, both in promoting and administering the program, in project work, in the project evaluating and approval process. There are also those who were involved in the design of the program.

Outside of DRIE, a number of officers in External Affairs, at headquarters and in posts, are involved in some capacity with the program. Officers in NRC are familiar with technology assistance programs.

Any evaluation, of whatever scope, should include interviews with all the Ottawa based officials mentioned above. Such interviews would enable coverage of some rationale issues (program design and delivery), some impacts and effects and some alternative issues.

2.3 Interviews with Program Participants

A number of past participants in program-supported activities have already been administered a questionnaire. That exercise has provided some information about the firms' opinions about their degree of satisfaction with the program, about possible program design changes, about some program results and about certain aspects of incrementality. Those questionnaires should be reviewed in the course of any evaluation.

In addition, it may be desirable to interview a sample of the participants, particularly if the evaluation covers impacts and effects and objectives achievement issues.

For some issues, non-participants would also have to be interviewed.

2.4 Expert Opinion

Some outside experts with knowledge about high technology, research and development, product development and marketing of high technology products would be approached to provide comments on some of the issues covered by the evaluation. They could also be part of the interview process.

2.5 Case Studies

Based on the limited number of projects undertaken so far under the program umbrella, case studies could be included in the evaluation methodologies. Case studies

take a more in-depth look, usually at a sample of projects, by combining several data collection methods.

Case studies are useful, for example, in looking at factors which influence a successful outcome. In the case of this program, case studies would be useful in the study of impacts and effects issues.

3. Methodology Rating

The estimated usefulness and reliability of each methodology in addressing each issue is given below. The ratings are high (H), medium (M), or low (L).

RATING OF METHODOLOGIES BY ISSUE CATEGORY

21/04/88

ISSUE	METHODOLOGIES					
	Document- ation Review	File Search	Interviews			Case Studies
			Officials	Firms	Experts	
1. <u>Rationale</u>						
1.1 Program Design	H	L	M	H	H	M
1.2 Program Delivery	-	M	H	H	-	M
2. <u>Objectives Achievement</u>						
- Awareness in Canada	-	L	M	H	M	M
- Awareness in Europe	-	L	H	M	M	M
- Participation	-	M	H	H	M	H
- Investigation	-	M	H	H	M	H
3. <u>Impacts and Effects</u>						
3.1 Agreements	-	H	H	H	H	M
3.2 R&D	-	L	L	M	M	M
3.3 New Technology	-	H	H	H	H	M
3.4 Awareness	-	L	M	M	H	M
3.5 Unintended impact	L	M	H	H	L	M
4. <u>Alternatives</u>						
4.1 Alternative Design	M	M	H	H	H	M
4.2 Alternative Delivery	L	M	H	L	L	L
4.3 Alternative Instruments	M	M	H	H	H	L

IV. OPTIONS FOR EVALUATION

The purpose of this section is to outline possible options for evaluating TOEP.

In a previous section, plausible evaluation issues were grouped by category. In theory, an evaluation could cover a limited number of issues, or all of them. In the case of TOEP, an option for an evaluation at this time that would cover all issues is more theoretical than real. The reason is that the program has not been in place long enough to have had many impacts yet. The number of projects relating to the program is still rather small. "Impacts and effects" issues and some "objectives achievement" issues are therefore not considered in the options outlined below.

The first option would concentrate on program design, both from a rationale point of view, i.e. "is there a need for such a program", and from an alternative point of view, i.e. "should the scope be enlarged" and "could other programs accomplish the same objectives". These issues appear to be the ones of highest interest to senior management.

The second option would look at the same issues as option one, plus the issues on program delivery as they are found under "rationale" and "alternatives". Those delivery issues may not be of paramount interest to senior management, but they are a matter of concern to managers and those involved in the delivery of the program, particularly if the program were to be expanded.

Description of Options

Option I: Program Rationale (Design) and Alternatives

Focus: The need for TOEP, in its present form or in a different form (different objectives, focus, activities, forms of assistance).

Usefulness: To assist in the design of new or modified programs in the context of DIST.

Issues Covered: Rationale: 1.1.1, 1.1.2, 1.1.3, 1.1.4
Alternative: 4.1.1, 4.1.2, 4.1.3, 4.3.1

Methodologies: ° Documentation and file reviews
° Interviews in DRIE, DEA, NRC, DOC
° Opinion of experts

Time and Cost Estimate: Total effort: 2.5 person-months
Elapsed time: 1.5 months
Consulting costs: \$25,000
Travel (estimated): \$3,000

Option II: Program Rationale (Design and Delivery) and Alternatives

Focus: ° The need for TOEP, in its present or in a different form (objectives, focus, activities, forms of assistance).
° Are the delivery systems the right ones.

Usefulness: To assist in the design of a program and of its delivery mechanisms.

Issues Covered: Same as Option I plus:
Rationale: 1.2.1, 1.2.2, 1.2.3
Alternative: 4.2.1, 4.2.2

Methodologies: ° Documentation and file reviews
° Interviews in DRIE, DEA, NRC, DOC
° Opinion of experts
° Interviews with a number of program participants

Time and Cost Estimate: Total effort: 4.0 person-months
Elapsed time: 2-2.5 months
Consulting costs: \$40,000
Travel (estimated): \$5,000

V. RECOMMENDATIONS

The Steering Committee, having considered senior management's requirements and program managers' needs, recommends that an evaluation be undertaken as soon as possible on the basis of Option II: Program Rationale (Design and Delivery) and Alternatives, in a phased approach, as follows:

- (i) initially, the equivalent of Option I;
- (ii) then, if required, the rest of Option II, i.e. the delivery issues.

In the Steering Committee, there was a clear preference to proceed with Option II; however, in view of time constraints and the need to prepare a Treasury Board submission,* it was felt that a phased approach would provide the required flexibility.

*As noted above, no new applications can be received under the program after September 30, 1988. A Treasury Board submission will have to be presented if the program is to be extended in its present or an expanded form.

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